REMARKS

Claims 1-36 are pending. We thank the Examiner for the indication of allowability of claims 3-10 and 19-26. Claims 3, 4, 8-10, and 29 have been currently amended to more clearly define the claimed subject matter, with no changes to the scope of the claim. However, we have not rewritten the allowable claims in independent form at this time as we respectfully traverse the rejection to the independent claims as follows.

Objection to Drawings under 37 CFR 1.83(a)

The Examiner has objected to the drawings alleging that the feature "an electrical filter" specified in claim 16 is not shown in the drawings presently on file. The Applicant respectfully traverses this objection.

In particular, the specification recites, "*To this end, the SADC 38 may contain an integrate-and-dump filter, or any other suitable low-pass filter, which takes M samples of the electrical signal v(t) every T_s samples and integrates these to produce one sample of y_k. The samples y_k produced in this manner are hereinafter referred to as electrical signal samples and are supplied to the non-linear function block 22. The SADC 38 may also contain additional filtering stages (e.g., an anti-alias filter)*" (Page 5, line 29 to page 6, line 4). Furthermore, on page 8, line 27 to page 9 line 1, the specification recites, "*Let it also be assumed for the time being that the SADC 38 is simply an integrate and dump filter (IDF), the output of which…*"

Therefore, it is evident that the SADC 38 shown in Figs 1 and 3 may include "an electrical filter" as recited in claim 16. 37 CFR 1.83(a) states that, "*…However, conventional features disclosed in the description and claims, where their detailed illustration is not essential for a proper understanding of the invention, should be illustrated in the drawing in the form of a graphical drawing symbol or a labeled representation (e.g., a labeled rectangular box).*"

Thus, the Applicant submits that the electrical filter of the SADC unit defined in claim 16 is a conventional feature disclosed in the description and claims, and its detailed illustration is not essential for a proper understanding of the invention. Accordingly, the SADC unit is illustrated in the drawing in the form of a labeled rectangular box. The Applicant submits that the

drawings are fully compliant with 37 CFR 1.83(a) and withdrawal of the objections under 37 CFR 1.83(a) is respectfully requested.

Rejections under 35 U.S.C. 112

The Examiner has objected to claims 4 to 10 under 35 U.S.C. 112, second paragraph, as being indefinite. In particular, the Examiner has referred to MPEP 2173.05(p) section II in support of his objection that claims 4, 8 to 10 claim both an apparatus and the method steps using the apparatus. The Examiner has also objected to the limitation "the threshold detector" in claim 4 as having insufficient antecedent basis. The Applicant has amended the allegedly contravening claims in order to overcome the Examiner's objections. The Applicant has amended the term "the threshold detector" to recite "the detector". A suitable antecedent basis exists for this term in claim 1 presently on file.

Moreover, the Applicant has amended claim 4 to recite, among others,

"...the detector being operative to render decisions about symbols present in the received optical signal comprises a program element for execution by a computing device to implement a method comprising the steps of..."

Therefore, the Applicant submits that amended claim 4 submitted herewith is definite and compliant with 35 U.S.C. 112, second paragraph, and withdrawal of the Examiner's objection thereto is respectfully requested.

The Applicant has similarly amended claims 8 to 10 and submits that amended claims 8 to 10 submitted herewith are also fully compliant with 35 U.S.C. 112, second paragraph. Withdrawal of Examiner's objections to claims 4 to 10 is courteously solicited.

The Examiner has further rejected to claim 16 under 35 U.S.C 112, first paragraph, as failing to comply with the enablement requirement. The Examiner alleges that the feature "an electric filter" was not described in the specification. The objection is respectfully traversed. As discussed under the section-heading Objection to Drawings under 37 CFR 1.83(a), the Applicant submits that there is sufficient support for the electrical filter in the specification.

In particular, the specification recites, "*To this end, the SADC 38 may contain an integrate-and-dump filter, or any other suitable low-pass filter, which takes M samples of the electrical signal v(t) every T_s samples and integrates these to produce one sample of y_k. The samples y_k produced in this manner are hereinafter referred to as electrical signal samples and are supplied to the non-linear function block 22. The SADC 38 may also contain additional filtering stages (e.g., an anti-alias filter)*" (Page 5, line 29 to page 6, line 4). Furthermore, on page 8, line 27 to page 9 line 1, the specification recites, *"Let it also be assumed for the time being that the SADC 38 is simply an integrate and dump filter (IDF), the output of which…."*

Thus, the integrate-and-dump filter, or suitable low-pass filter, takes M samples of the electrical signal v(t) every T_s samples and integrates these to produce one sample of y_k. It will be readily apparent to one skilled in the art that the IDF or the low-pass filter referred to herein is an electrical filter. The Applicant submits that an example of an "electrical filter" of claim 16 is described in the specification in such a way as to enable one skilled in the art to which it pertains, or which it is most nearly connected, to make and/or use the invention. Therefore, the Applicant requests that the objection to claim 16 under 35 U.S.C., first paragraph, be withdrawn.

Rejections under 35 U.S.C. 101

The Examiner has rejected claims 4 to 10 under 35 U.S.C. 101 based on the theory that the claims are directed to neither a "process" nor a "machine", but rather embraces or overlaps two different statutory classes of invention in the alternative only.

The Applicant reiterates the submission made under the section-heading Rejections under 35 U.S.C. 112 with respect to the allegedly contravening claims. In particular the Applicant submits that the subject matter of amended claims 4 to 10 is directed to a system for detecting digital symbols carried in a received optical signal and not to a "process" *per se*. Therefore, the amended claims 4 to 10 submitted herewith are fully compliant with 35 U.S.C. 101, and withdrawal of the Examiner's objection thereto is respectfully requested.

Rejections under 35 U.S.C. 103

The Examiner has rejected claims 1, 2, 11 to 13, 15, 17, 18, and 27 to 36 under 35 U.S.C. 103(a) as being unpatentable over United States Patent No. 7,031,405 to Touzni et al in view of United States Patent No. 7,110,923 to Reiss et al. The Examiner has rejected claims 14 and 16 as being obvious over Touzni et al in view of Riess et al and further in view of Sugihara et al (United States Patent Application Publication No. US 2005/0105919).

For the Examiner to establish a prima facie case of obviousness, three criteria must be considered: (1) there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine the reference teachings, (2) there must be a reasonable expectation of success, and (3) the prior art references must teach or suggest all of the claim limitations (MPEP §§ 706.02(j)). For the reasons that follow, the Applicant respectfully submits that the Examiner has failed to demonstrate a prima facie case of obviousness.

The system for detecting digital symbols carried in a received optical signal according to claim 1 recites, in part, *"to evaluate a non-linear function of each received sample, thereby to produce a stream of processed samples."*

Touzni et al, on the other hand, teach carrier recovery using carrier frequency phase error estimation employing a single-axis constant modulus (SA-CM) criterion to generate the carrier frequency phase error (for example, see column 6, lines 11 to 15). In particular, Touzni et al disclose that, *"Equalizer 461 of detector 424 applies equalization to the sequence of samples from timing recovery module 423. Equalizer 461 may be implemented with an adaptive, multi-tap filter in a linear or non-linear architecture and with a finite or infinite impulse response"* (column 8, lines 59 to 63). Touzni et al further recite that *"decision feedback equalization (DFE) may be preferred over a linear filter"* (column 8, line 67 to column 9, line 1).

Touzni et al. teach the use of a Decision Feedback Equalizer which can be a nonlinear equalizer. However a nonlinear equalizer does not necessarily evaluate *"a non-linear function of each received sample, thereby to produce a stream of processed samples,"* as claimed herein, and Touzni does not teach or suggest evaluating a nonlinear function as claimed.

Moreover, Touzni et al teach that, "*The sequence of samples is then provided to detector 424, which generates an estimate for each sample corresponding to a transmitted symbol. Detector 424 filters the signal with matched filter 460 whose frequency response characteristic matches the frequency response of the transmitter's pulse shaper. For example, if the pulse shaper applies a filter corresponding to a square root-raised cosine function, the matched filter also applies a square root-raised cosine to i) create a Nyquist pulse at the matched filter output and ii) maximize signal-to-noise ratio*" (Column 8, lines 46 to 58).

However, a "*square root-raised cosine function*" is not a non-linear function. Nowhere do Touzni et al teach or suggest a functional element "*to evaluate a non-linear function of each received sample, thereby to produce a stream of processed samples*" and a detector operative "*to render decisions about individual symbols present in the received optical signal on the basis of the stream of processed samples.*"

Furthermore, conventional decision devices, as exemplified by Riess et al, assume a Gaussian statistics (Column 11, lines 20 to 22) and not a non-linear function as claimed. Specifically, the system according to claim 1 evaluates a non-linear function to improve the performance of the decision device.

Touzni et al and Riess et al neither individually nor collectively teach or suggest "*to evaluate a non-linear function of each received sample, thereby to produce a stream of processed samples*", thus, they do not teach or suggest all of the claim limitations of independent claims 1, 17, 28, and 36. It follows that merely incorporating the optical signal of Riess et al in the device of Touzi et al would not have led, in an obvious manner, to the claimed invention.

The Applicant submits that there is no suggestion or motivation in Touzni et al "*to evaluate a non-linear function of each received sample, thereby to produce a stream of processed samples.*" Therefore, there would be no motivation to combine Touzni et al with any of the other references cited. Furthermore, even if there were motivation to combine Touzni et al with any of the other references cited, which the Applicant expressly denies, the Applicant submits that Touzni et al fail to teach or suggest all of the claim limitations of the present application. The applicant therefore submits that Touzni et al fail, alone or in combination with

any of the other cited references, to teach or reasonably suggest the limitations of the claims
of the present application.

For the Patent Office to combine references in an obviousness analysis, the Patent Office
must do two things. First, the Patent Office must articulate a motivation to combine the
references, and second, the Patent Office must support the articulated motivation with actual
evidence. *In re Dembiczak*, 175 F.3d 994,999 (Fed. Cir. 1999). While the range of sources
for the motivation is broad, the range of available sources does not diminish the requirement
for actual evidence. *Id.*

In order to prevent hindsight analysis, there must be some motivation or suggestion to
combine specific prior art in such a way as to arrive to the combination disclosed in the patent
at issue. See, e.g., Yamanouchi Pharmaceutical Co., Ltd. v. Danbury Pharmacal, Inc., 231
F.3d 1339, 1343 (Fed. Cir. 2000): *"the suggestion to combine requirement stands as a critical
safeguard against hindsight analysis and rote application of the legal test of obviousness."*,
and Ecolochem, Inc. v. Southern California Edison Co., 227 F.3d at 1371-1372 (Fed. Cir.
2000), *"Combining prior art references without evidence or a suggestion, teaching, or
motivation simply takes the inventor's disclosure as a blueprint for piecing together the prior
art to defeat patentability--the essence of hindsight."*

In view of the failure of any of the cited references to teach or reasonably suggest evaluating a
non-linear function for each received sample, the Applicant respectfully submits that the
Examiner can only combine the references with the benefit of hindsight analysis, which is
forbidden. Consequently, and in view of the arguments made above with respect to Touzni et
al's failure to teach or reasonably suggest the limitations of the claims of the present
application, each claim rejection by the Examiner based on the Touzni et al reference is
unfounded.

Accordingly, it is respectfully submitted that the above-mentioned rejections fail to establish a
prima facie case of obviousness, by failing to provide and support an adequate motivation to
combine the cited references to support the rejection, and by failing to teach or reasonably
suggest all of the limitations of claims 1, 2, 11 to 13, 15, 17, 18, and 27 to 36. Therefore,
Applicant respectfully requests that the Examiner withdraw his rejections of claims 1, 2, 11 to
13, 15, 17, 18, and 27 to 36 under 35 U.S.C. § 103(a).

Since claims 14 and 16 directly or indirectly depend from and include the limitations of independent claim 1, the Applicant respectfully requests that the Examiner's rejection of these claims under 35 U.S.C. §103(a) also be withdrawn.

The Examiner has objected to claims 3 to 10 and 19 to 26 as being dependent upon a rejected base claim. However, based on the foregoing discussion, the Applicant submits that each of the base claim upon which claims 3 to 10 and 19 to 26 depend from define patentable subject matter. Accordingly, withdrawal of the objections to claims 3 to 10 and 19 to 26 is courteously solicited.

We believe no fee is required. However, if a fee is due, the Commissioner is hereby authorized to charge any additional fees, and credit any overpayments to Deposit Account No. 501593, in the name of Borden Ladner Gervais LLP.

The Applicant submits that the application is now in condition for allowance, and favorable action to that end is respectfully requested.

Respectfully submitted,

BONTU, Chandra

By: /Jeffrey Measures/
Jeffrey Measures
Reg. No. 40,272
Borden Ladner Gervais LLP
World Exchange Plaza
100 Queen Street, Suite 1100
Ottawa, ON K1P 1J9
CANADA
Tel: (613) 237-5160
Fax: (613) 787-3558
E-mail: ipinfo@blgcanada.com

JMM/MC/dbm